

## **SPECIFICATION**

### **TITLE OF THE INVENTION**

**Inflatable Spheroidal Life Raft With Internal Ballast Tank**

### **CROSS-REFERENCE TO RELATED APPLICATIONS**

**Not applicable.**

### **STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT**

**Not Applicable**

### **REFERENCE TO SEQUENCE LIST, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX**

**Not Applicable**

## **BACKGROUND OF THE INVENTION**

The patent class definition for rafts is class 441/35 and there are 112 patents listed on the USPTO website under that classification.

There are 76 patents listed under subclass 441/38 "With shelter" that falls under class 441/35, but PN 3,883,913 is the only one that contains a claim that is somewhat similar to Claim 1 of this application. PN 3,883,913 contains a "hemispherical" dome-like enclosure whereas this application contains a "spheroidal" globe-like enclosure, the difference being a half-sphere enclosure vs. a full-sphere enclosure.

The field of endeavor to which the invention submitted in this application pertains is best described as relating to U.S. Patent Classifications 441/35 "Raft", 441/38 "With shelter" and 441/40 "Inflatable".

The invention related to this application has an inflatable multi-panel exterior spheroidal shell wall that forms an enclosed shelter and an internal water-inflatable ballast tank that work in conjunction with each other to render the raft incapable of capsizing.

Prior art, as evidenced by the below-listed patents, does not claim an inflatable multi-panel exterior spheroidal shell wall or an internal water-inflatable ballast tank.

Referenced patents are; PN 6,325,688, PN 5,919,068, PN 5,800,225, PN 5,733,158, PN 5,927,258, PN 4,890,569, PN 3,058, 127, PN 3,092,854 and PN 4,998,900.

Patent PN 5,927,228 is classified U.S. 114/345 and 441/40.

Patent PN 4,890,569 is classified U.S. 114/349, 114/125, 441/37 and D12/316.

All other patents listed are classified U.S. 441/38 with various other sub-classes and all are inflatable and use tarpaulins as shelter except PN 4,890,569 that has a semi-rigid canopy.

All of the above-listed rafts are subject to excessive rolling, tipping and/or capsizing thereby promoting possible injuries and death to occupants

Tarpaulins used as shelter provide little insulation against extremely cold weather and they are subject to damage caused by high winds and heavy seas.

## **BRIEF SUMMARY OF THE INVENTION**

The invention is an air-inflatable multi-panel wall multi-cell spheroidal shell life raft that is constructed of inflatable cells and panels that form an enclosed air-insulated shelter for occupants. Perimeter windows with removable covers allow cross ventilation when desired and the raft contains an internal water-inflatable ballast tank that enhances stability.

Key features are the air-inflatable spheroidal shape of the shell, the water-inflatable internal ballast tank and the relationship of the shell to the ballast tank.

Unlike prior art, the raft resists rolling and tipping and will not capsize when occupants and their belongings are equally distributed within the enclosure. Rolling, tipping and capsizing has caused injuries and deaths in the past and this new art resists such occurrences. The air space in the multi-panel exterior wall of the spheroidal shell provides buoyancy and enhances insulation against extremely cold weather. Prior art that uses tarpaulins as shelters does not sufficiently protect occupants from extreme cold weather.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

THREE drawings, **Fig. 1**, **Fig. 2** and **Fig.3** are included in these specifications of this Non-provisional Patent Application.

**Fig. 1** is a plan view of the raft from above that shows the horizontal perimeter shell wall, the locations of windows that penetrate the wall and act as access and egress portals, the circular floor cushion and the internal ballast (dotted line) that is centered beneath the floor cushion of the raft,

**Fig.2** is a vertical cross section of the raft that shows the perimeter shell wall, the locations of windows that penetrate the wall and act as access and egress portals, the floor cushion and the internal ballast that is centered beneath the floor cushion of the raft,

**Fig.3** is a vertical section that shows the location of the top hatch and locations of the straps and harness when they are stored and when they are deployed.

The drawings illustrate that the invention relating to this application is comprised of an air-or-gas-inflated multi-panel spheroidal shell **1**; with mechanical ties and/or separators **2**; panel joints **3**; window openings **4**; window covers **5**; internal water-inflated ballast tank **6 & 7**; floor cushion **8**; top-hatch **9**; the hatch when in the open position **10**; the straps when stored **11**; and the straps when deployed **12**; all of which are constructed and/or manufactured by hand and/or by machines utilizing methods and materials that are normal to the production of air-or-gas-inflated rafts that are classified by the United States Patent and Trademark Office as **Class 441/35 "Rafts"** and **441/40 "Inflated"**. Miscellaneous items and accessories normal to raft construction may be installed, but they are not listed, as they are not pertinent to this application.

## **DETAILED DESCRIPTION OF THE INVENTION**

Prior art inflatable rafts as exemplified by Givens PN 3,883,913 and Andrew et al PN 4,533,333 rely on tubular floatation elements (Givens#2 and Andrew et al #11) that provide buoyancy to support raft occupants and their belongings.

The new art of the invention described in these specifications does not rely on tubular floatation elements. The buoyancy required is produced by the inflatable panels that are joined together by continuous joints along the edges of the panels thus forming the spherical globe-like shape of the raft. Therefore, the entire shell of the raft provides buoyancy wherever and whenever it is needed, whereas the Abstract of the Givens Raft Invention clearly states that buoyancy provided by the Givens raft is provided by "a buoyant inflatable structure circumscribing a floor" and it goes on to state that a hemispherical shelter is attached to the top of the buoyant structure. No claim in the Givens Specification or in the Andrew et al specifications states that buoyancy is provided by the hemispherical structure.

Prior art does not include a spherical globe-like shaped inflatable raft, again as exemplified by Givens PN 3,883,913 and Andrew et al PN 4,533,333, both of which provide hemispheric shaped dome-like structures (Givens #12 and Andrew et al #17) mounted on top of single and/or multiple tubular donut shaped inflatable chambers. Two hemispheres separated by a buoyant tubular chamber that protrudes beyond the exterior surfaces of the hemispheres do not constitute a sphere and do not function as a sphere.

The new art described herein does not allow any inflatable protrusions outside the exterior wall of the spherical raft because such protrusions would provide excessive buoyancy that would cause the raft to tip up when the leading edge of the raft meets the leading edge of a wave and would cause the raft to tip down when the trailing edge of the raft exits the trailing edge of a wave, again as exemplified by the performance of the raft patented by Givens PN 3,883,913 and countless other prior art rafts.

Prior art relies on open bags and or sacks hanging from the underside of tubular floatation devices as a means of providing some ballast in an attempt to resist tipping and/or capsizing, once again best exemplified by Givens PN 3,883,913 and Andrew et al PN 4,533,333 (Givens, "water-filled chamber" #38 and Andrew, "a water filled ballasting chamber" #22), both of which have openings to allow and encourage water and atmosphere to freely flow into and out of said chambers.

The new art of the invention described in these specifications provides "a water-inflated ballast tank" that confines the ballast water and/or atmosphere therein by not allowing the water and/or atmosphere to enter and/or exit the tank unless the raft occupant(s) intentionally cause the water and/or the atmosphere to enter or exit the tank.

The unique concept of the art of the invention described in these specifications is exactly opposite of the inventions of Givens PN 3,883,913, Andrew et al PN 4,533,333 and countless other prior art rafts. The physics supporting the functioning of the new art raft may best be described as follows.

When the new art raft encounters the force of a wave, the buoyancy provided by the inflated upper shell of the raft becomes a force acting through a fulcrum about the center of the raft to hold the top of the raft up and the water-inflated ballast tank becomes an opposing force acting through a fulcrum about the center of the raft to hold the bottom of the raft down thus creating equal counter-forces that thereby ensure the stable verticality of the raft. This synergistic action would not be possible if a buoyant chamber protrudes from the exterior of the spheroidal raft.

The spherical raft shell and the ballast tank together with other components required to construct the raft will be comprised of flexible coated fabric sheets and/or flexible rubber or plastic film that is glued and/or heat-fused and/or chemically-fused together to the configurations required to form the shapes of panels, cells and/or chambers of the raft. All materials and methods required to construct the raft shall be in conformance with normal existing materials and methods presently utilized in the inflatable raft industry. Joints between panels shall consist of the overlapping of the edges of contiguous panels. Longitudinal and latitudinal joints may or may not be reinforced with tape such as produced by the 3M company that contains high tensile strength as will be required to support the full weight of the raft when fully occupied (including ballast water weight when unavoidable) in order to allow the raft to be hoisted over the side of a vessel or to be hoisted out of the water by ship or helicopter.

Longitudinal joints shall be extended beyond the top of the raft to form straps that will be looped around a harness to allow a grappling hook or other such device to engage the harness during rescue operations.